IN THE CLAIMS:

1. (Currently Amended) A shutter mechanism for controlling reactants in a direct oxidation fuel cell system, having at least one fuel cell including a membrane electrode assembly, comprising:

a moving component disposed within the fuel cell between a source of a reactant and the membrane electrode assembly, said moving component having a plurality of laterally displaced protrusions, wherein said movable component is adjustable in a direction perpendicular to the plane in which the component is disposed, such that when it is adjusted, the component travels generally in a z-axis within a vapor gap, closer to or further away from an anode current collector, to control fuel flow while not consuming substantially additional volume within the fuel cell; and

~~a receiving element~~the anode current collector formed ~~forming~~ with a plurality of laterally displaced openings corresponding to the plurality of laterally displaced protrusions, such that when said moving component is placed adjacent to said receiving element, the flow of said reactant is controlled, wherein said movable component is configured such that when said movable component is adjusted to a closed position, said protrusions interconnect with the openings in the anode current collector to substantially seal said openings, and said movable component also having apertures therein interspersed with said protrusions in such a manner that when said movable plate is in an open position, said apertures allow for flow of fuel therethrough to the membrane electrode assembly.

2. (Cancelled)

3. (Previously Presented) The shutter mechanism as defined in claim 1 wherein said moving component is placed between a fuel source and an anode aspect of said fuel cell, and

said receiving element is an anode current collector and when said moving component is placed adjacent to said anode current collector, fuel flow to said anode aspect is restricted.

4. (Currently Amended) A shutter mechanism for a direct oxidation fuel cell system, comprising:

(A) a fuel source;

(B) a direct oxidation fuel cell, including:

(i) a protonically conductive membrane having catalyst coatings on each of its major surfaces, being an anode aspect and a cathode aspect;

(ii) an anode current collector disposed generally at said anode aspect;

(iii) a cathode current collector disposed generally at said cathode aspect;

(iv) a passive mass transport barrier disposed generally between said fuel source and said anode aspect and spaced from said anode aspect to define a vapor gap in said fuel cell, said passive mass transport barrier controlling a rate of fuel delivery to said catalyzed anode aspect of said fuel cell;

(v) a movable shutter plate having a plurality of laterally displaced protrusions disposed within said vapor gap between said passive mass transport barrier and said anode current collector which forms a plurality of laterally displaced openings corresponding to the plurality of laterally displaced protrusions such that said movable shutter plate is adjustable to substantially or partially prevent fuel flow through said anode current collector to the anode aspect of said fuel cell, wherein said movable plate is configured such that

when said movable plate is adjusted to a closed position, said protrusions interconnect with the openings in the anode current collector to substantially seal said openings, and said movable plate also having apertures therein interspersed with said protrusions in such a manner that when said movable plate is in an open position, said apertures allow for flow of fuel therethrough, and said movable plate is adjustable in a direction perpendicular to the plane in which the plate is disposed, such that when it is adjusted, the plate travels generally in a z-axis within said vapor gap, closer to or further away from said anode current collector, to control fuel flow while not consuming substantially additional volume within said fuel cell; and

(vi) a load coupled between said anode current collector and said cathode current collector for utilizing the electricity generated by the fuel cell.

5. (Cancelled)

6. (Currently Amended) The shutter mechanism as defined in claim ~~5~~ 4 further comprising:

said protrusions have angled sides; and

said openings in said anode current collector being correspondingly angled such that said protrusions interconnect securely within said angled openings of said current collector to substantially seal said openings against fuel flow.

7. (Currently Amended) The shutter mechanism as defined in claim ~~5~~ 4 wherein said protrusions are substantially comprised of a compliant material that is compressed into said openings when said movable plate is adjusted to a closed position.

8. (Currently Amended) The shutter mechanism as defined in claim ~~5~~ 4 further comprising a coating disposed on the sides of said protrusions in said movable plate which further secures sealing of said anode current collector against fuel flow therethrough.

9-26. (Cancelled)